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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,189	06/30/2003	Menahem Lasser	246/206	8784

7590 05/06/2005

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EXAMINER

CHACE, CHRISTIAN

ART UNIT

PAPER NUMBER

2189

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,189

Applicant(s)

LASSER, MENAHEM

Examiner

Christian P. Chace

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 17-19, 21-26, 28 and 30 is/are rejected.
7) ☒ Claim(s) 20, 27, 29 and 31 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 10 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office action has been issued in response to amendment filed 10 March 2005. Claims 1-33 are pending. Claims 1-16, 32, and 33 are allowed. Claims 17-19, 21-26, 28, and 30 are rejected. Claims 20, 27, 29, and 31 are objected to. Applicants' arguments have been carefully and respectfully considered, but they are not entirely persuasive. Accordingly, this action has been made FINAL, as necessitated by amendment.

Drawings

The drawings were received on 10 March 2005. These drawings are approved by examiner. Examiner has properly titled the sheets in the interest of compact prosecution. In the future, applicants are respectfully requested to submit drawing sheets titled as required by 37 CFR 1.121(d).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

With respect to claim 19, examiner cannot determine the metes and bounds of "*operationally associated... in a reversible manner*," as examiner has no idea what this means. Even having looked to the specification, it does not appear to be *defined*

anywhere therein, which also precipitates a "lack of enablement," and a "lack of written description," rejections under 35 USC 112, 1st paragraph in addition to the instant rejection under 35 USC 112, 2nd paragraph, the rejections of which are hereby incorporated and applied to the instant claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-19, 21-26, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Chen et al (US Patent Application Publication 2003/0137888).

With respect to independent claims 17, 26, 28, and 30, with claim 17 being representative herein for the sake of efficiency, AAPA discloses a data storage system in page 1 of the instant specification, and shown in figures 1A and 1B, for example.

A data storage medium including a plurality of pages is disclosed in page 2, line 17 of the instant specification.

A controller for writing data to said plurality of pages in a manner that precludes corruption of old data stored in a first of said plurality of pages if writing said new data to a second of said plurality of pages is interrupted is disclosed in page 4, lines 3-20 of the instant specification. The scope of the instant limitation merely requires storing data to a paged memory. The claim language does not require any relationship between the

timing or location of the pages written. Accordingly, the prior art systems in the instant specification discuss writing data to different pages of memory. As applicants also discuss, unless the specific conditions applicant discloses in the AAPA exist, the flash would operate acceptably by writing the pages to different blocks, for example, which would, indeed, preclude the corruption of any data stored in one page that is not included in the risk zone of another page.

The difference between the instant claim and AAPA is the explicit recitation of a second one of said plurality of pages sharing at least one cell of said data storage medium with said first one of said plurality of pages.

Chen et al disclose two bits of data from different pages being programmed into one of four states of the individual cells in paragraph 8, e.g.

Therefore, it would have been obvious to one of ordinary skill in the art, having the teachings of AAPA and Chen et al before him/her at the time of the invention, to modify the corruption preclusion of AAPA to include the multi-state cells of Chen et al because they shrink the size of the memory arrays and increase the density of data storage of such arrays, as disclosed by Chen et al in paragraph 2, e.g.

With respect to claim 18, the storage medium and the controller being operationally associated within a common housing is disclosed in the specification at page 1, line 27.

With respect to claim 19, the data storage medium and controller being "reversibly operationally associated," in so far as it is clear, is anticipated at page 1, line 21 of the instant specification.

With respect to claims 21 and 22, the data storage medium being a flash memory is disclosed at page 4, line 8 of the instant specification, for example.

With respect to claim 23, the flash being multi-level cell flash is disclosed at page 5, line 25 into page 7, line 19, where specific conditions discussed supra with respect to claim 17 are set forth, but the interpretation with respect to claim 17 will still work if the flash is a multi-level cell technology for all situations in which the conditions set do not exist – one can still write 2 different pages to two different blocks of an MLC flash, and the second page would not corrupt the first.

With respect to claim 24, the flash memory including a plurality of blocks, such that that each [block of] said [plurality of] blocks includes a respective subplurality of said [plurality of] pages, and wherein said controller writes said new data to said respective subplurality of said plurality of pages of each block only sequentially is disclosed in page 5, line 4 of the instant specification.

With respect to claim 25, the flash memory including a plurality of blocks, such that that each [block of] said [plurality of] blocks includes a respective subplurality of said [plurality of] pages, and wherein said controller writes said new data to said respective subplurality of said plurality of pages of each block in a random order is disclosed in page 5, line 7 of the instant specification as being “not amenable to such shortcuts and requiring brute force methods,” which include random order writes.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 17-19, 21-26, 28, and 30 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Chen et al (cited supra).

With respect to independent claims 17, 26, 28, and 30, with claim 28 being representative for efficiency, a data storage system comprising a data storage medium including a plurality of physical pages is disclosed in figure 1.

A controller for accessing said data storage medium as a plurality of logical pages, with each said physical page spanning at least a portion of each of at least two said logical pages of said plurality of logical pages is disclosed in figure 1, as controller 13. Two or more sectors forming a page is disclosed in paragraph 24, e.g.

The controller writing new data to said plurality of logical pages in a manner that precludes corruption of old data stored in a first one of said plurality of logical pages if writing said new data to a second one of said plurality of logical pages, that is spanned by at least one of said physical pages that also spans said first one of said plurality of logical pages, is interrupted, is disclosed in paragraphs 2, 3, 6, and 8. The interruption is a disturb to the cells when programming or reading, as discussed in paragraph 3.

Widening the spreads, as discussed in paragraph 29, e.g., precludes corruption.

Examiner also notes that ECC (paragraph 5, e.g.) could very reasonably be interpreted as "precluding corruption" of data.

With respect to claim 18, the storage medium and controller are inherently "operationally associated" with a common housing.

With respect to claim 19, the data storage medium being operationally associated with said controller is inherent as discussed supra. Examiner does not know, nor can he figure out from the instant specification, what is meant by "in a reversible manner."

With respect to claims 21-22, a flash memory is disclosed in paragraph 20, e.g.

With respect to claim 23, multi-level cells are disclosed in paragraph 8, e.g., as discussed supra.

With respect to claim 24, writing pages to each block sequentially and randomly is disclosed in paragraphs 22 (addressed group of cells), 23 (blocks divided into pages), and figure 1, which shows the blocks in order.

With respect to claim 25, writing in a random order overall is inherent in the disclosure of parallelism in paragraph 24.

Examiner also strongly encourages applicants to review the patents incorporated by reference into Chen et al for more explicit discussions of the instantly claimed subject matter.

Allowable Subject Matter

Claims 1-16, 32, and 33 are allowed.

Claims 20, 27, 29, and 31 are objected to as containing allowable subject matter, but being dependent upon rejected base claims. Claims 20, 27, and 29 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to independent claims 1 and 31-33, as well as dependent claims 20, 27, and 29, a "risk zone" is recited. As noted supra, this is not a term of art with an accepted meaning, which forces examiner to look to the specification for the definition of same in order to determine the metes and bounds of the claims. On page 9 of the instant specification at lines 4-8 as well as at pages 12-13, the term "risk zone" is defined, "...as the set of *other* pages whose data are placed at risk of corruption when the page is written." This definition in and of itself does not render the claim patentable over the cited prior art of record. Indeed, the adjacent memory cells of Chen et al (US Patent Application Publication 2003/0137888 could be interpreted as "risk zones" due to the field coupling, for example, as disclosed in the title. However, the instant claims also recite, "writing said new data to said at least one unwritten page only if, for each said at least one unwritten page, said risk zone of said each at least one unwritten page lacks written pages." There is no teaching in the cited prior art of record that teaches or suggests this limitation.

The claims upon which the instant claims depend are allowable for at least the reasons set forth supra with respect to same.

Response to Arguments

With respect to applicant's argument that the reversible association claimed in claim 19 was intended to recite what is stated on page 10, line 25 to page 11, line 3, examiner has made note of same. However, this statement in the specification does not appear to shed any light into what was meant by the operational association being reversible. Mere statement of the words in the specification does not enable one of ordinary skill in the art to make and/or use the invention, understand the metes and bounds of such recitation, for example.

With respect to applicant's arguments regarding AAPA, they are moot in light of the new grounds for rejection necessitated by amendment. Examiner has attempted to further clarify his position supra with respect to same as well.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian P. Chace whose telephone number is 571.272.4190. The examiner can normally be reached on MAXI FLEX.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 571.272.4201. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Christian P. Chace
Primary Examiner
Art Unit 2189



REPLACEMENT SHEET

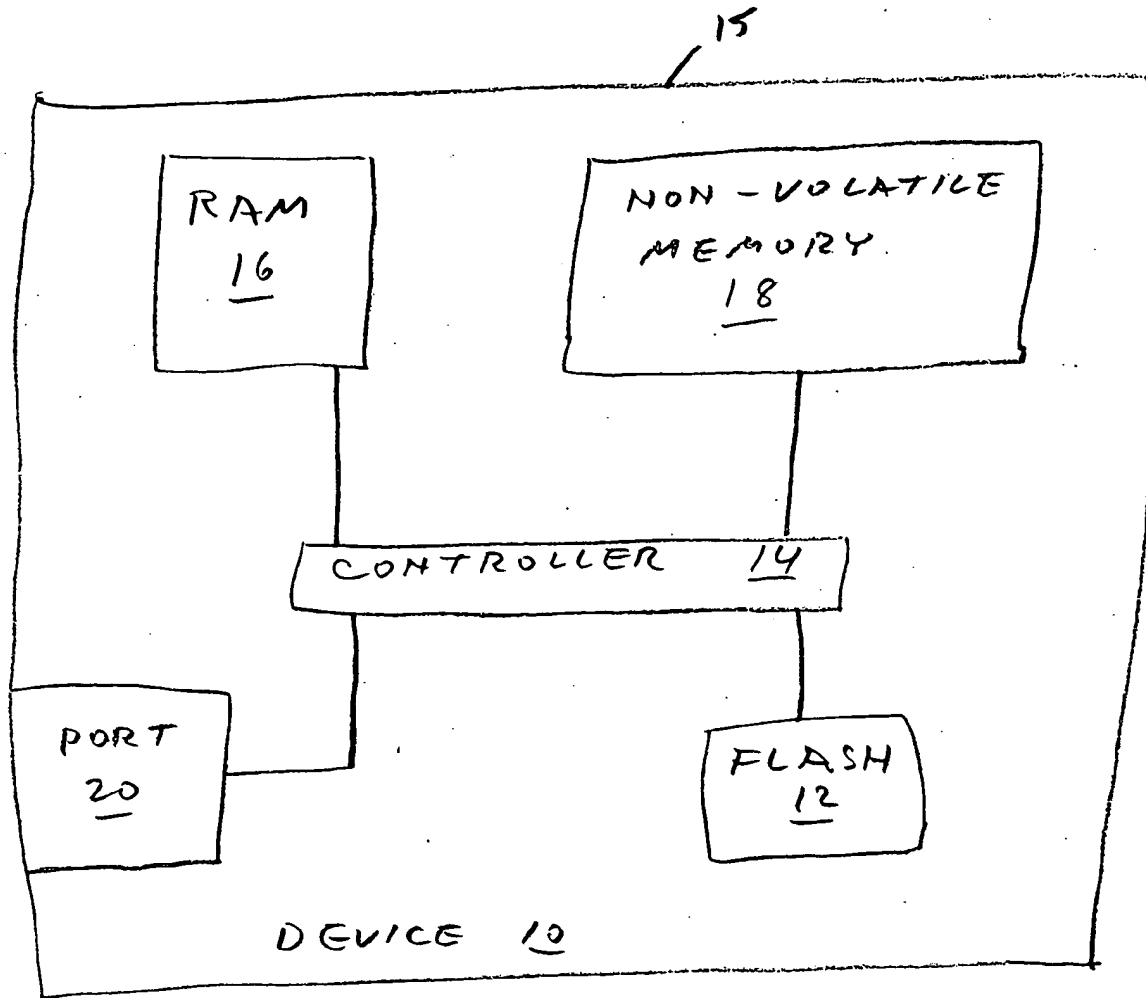


FIG. 1A (PRIOR ART)

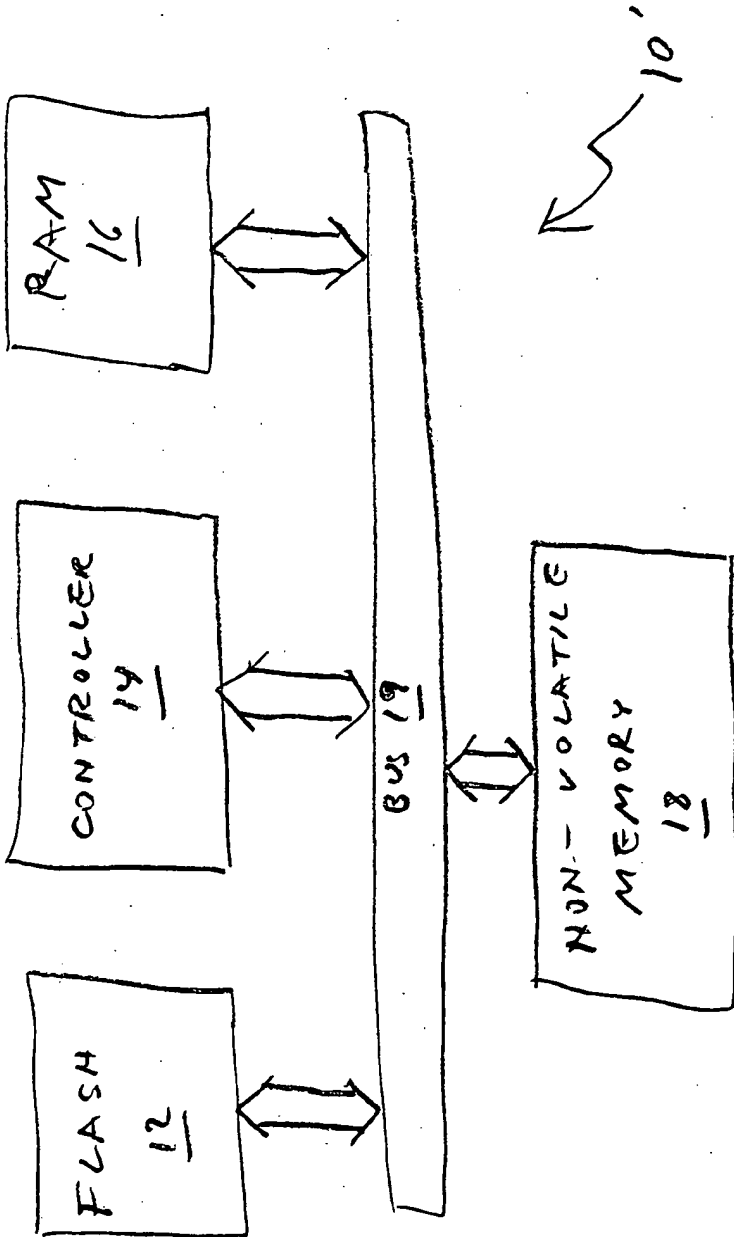


FIG. 18 (PRIOR ART)

REPLACEMENT SHEET

0	PAGE 32	}	24
1	PAGE 32		
2	PAGE 32	}	34
3	PAGE 32		
4	PAGE 32	}	34
5	PAGE 32		
6	PAGE 32	}	34
7	PAGE 32		
8	PAGE 32	}	34
9	PAGE 32		
10	PAGE 32	}	34
11	PAGE 32		
12	PAGE 32	}	34
13	PAGE 32		
14	PAGE 32	}	34
15	PAGE 32		
16	PAGE 32	}	34
17	PAGE 32		
18	PAGE 32	}	34
19	PAGE 32		
20	PAGE 32	}	34
21	PAGE 32		
22	PAGE 32	}	34
23	PAGE 32		
24	PAGE 32	}	34
25	PAGE 32		
26	PAGE 32	}	34
27	PAGE 32		
28	PAGE 32	}	34
29	PAGE 32		
30	PAGE 32	}	34
31	PAGE 32		
32	PAGE 32	}	34
33	PAGE 32		
34	PAGE 32	}	34
35	PAGE 32		
36	PAGE 32	}	34
37	PAGE 32		
38	PAGE 32	}	34
39	PAGE 32		
40	PAGE 32	}	34
41	PAGE 32		
42	PAGE 32	}	34
43	PAGE 32		
44	PAGE 32	}	34
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46	PAGE 32	}	34
47	PAGE 32		
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49	PAGE 32		
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51	PAGE 32		
52	PAGE 32	}	34
53	PAGE 32		
54	PAGE 32	}	34
55	PAGE 32		
56	PAGE 32	}	34
57	PAGE 32		
58	PAGE 32	}	34
59	PAGE 32		
60	PAGE 32	}	34
61	PAGE 32		
62	PAGE 32	}	34
63	PAGE 32		

30
←

FIGURE 2 (PRIOR ART)



NEW SHEET

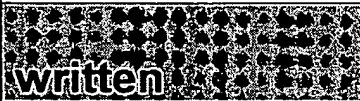
default →	address	status
	0	 page <u>32</u>
	1	unwritten page <u>32</u>
	2	unwritten page <u>32</u>
	3	unwritten page <u>32</u>

FIGURE 4A



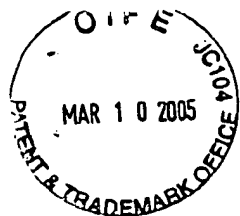
NEW SHEET

address	status	
0	written	page <u>32</u>
1	unwritten	page <u>32</u>
2	unwritten	page <u>32</u>
3	unwritten	page <u>32</u>

write →

← copy

FIGURE 4B



NEW SHEET

address	status
0	written page <u>32</u>
1	unwritten page <u>32</u>
2	written page <u>32</u>
3	written page <u>32</u>

FIGURE 4C

NEW SHEET

address	status
0	deleted page <u>32</u>
1	deleted page <u>32</u>
2	written page <u>32</u>
3	written page <u>32</u>

FIGURE 4D

NEW SHEET

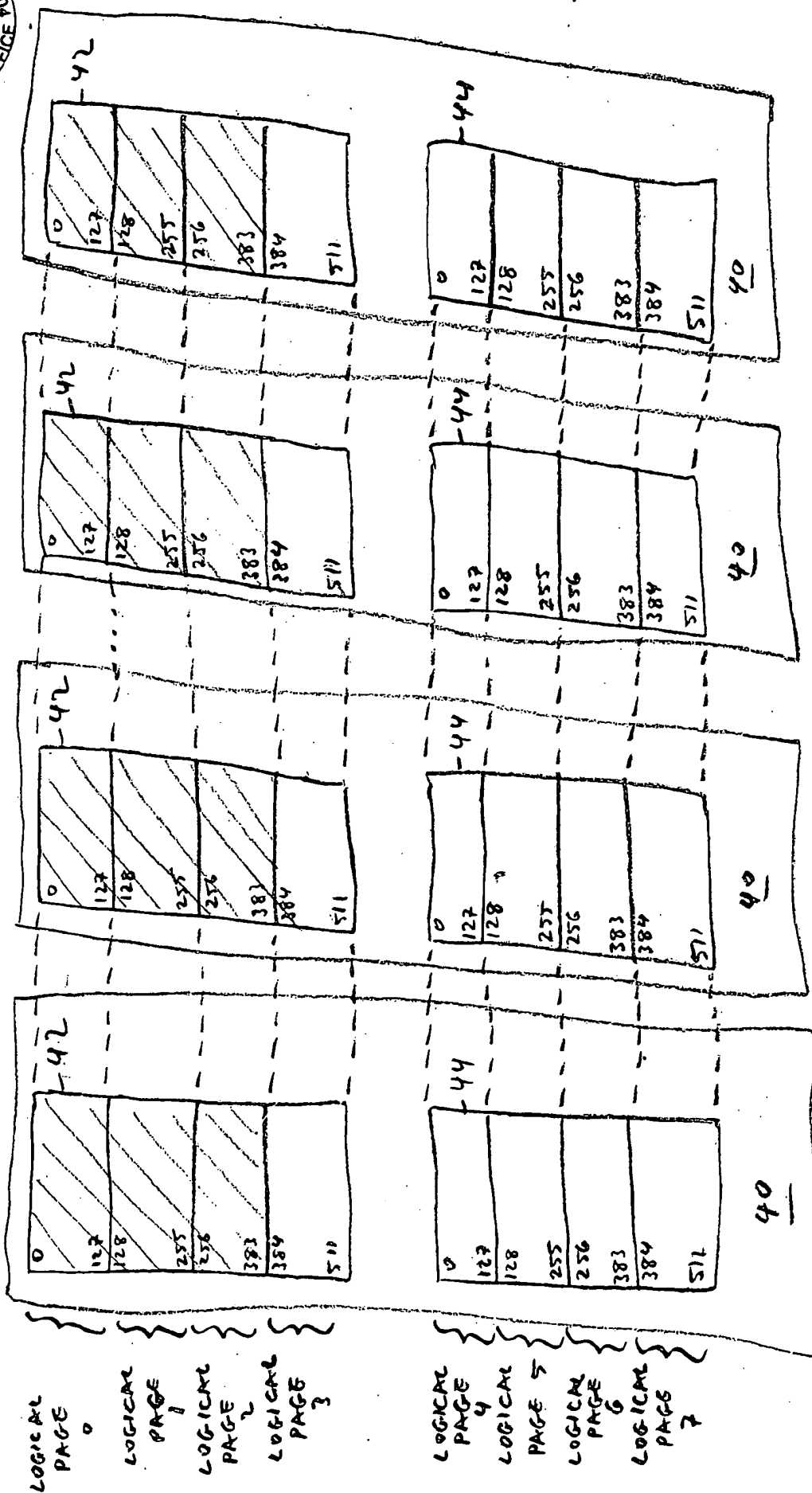


FIGURE 5 (PRIOR ART)



NEW SHEET

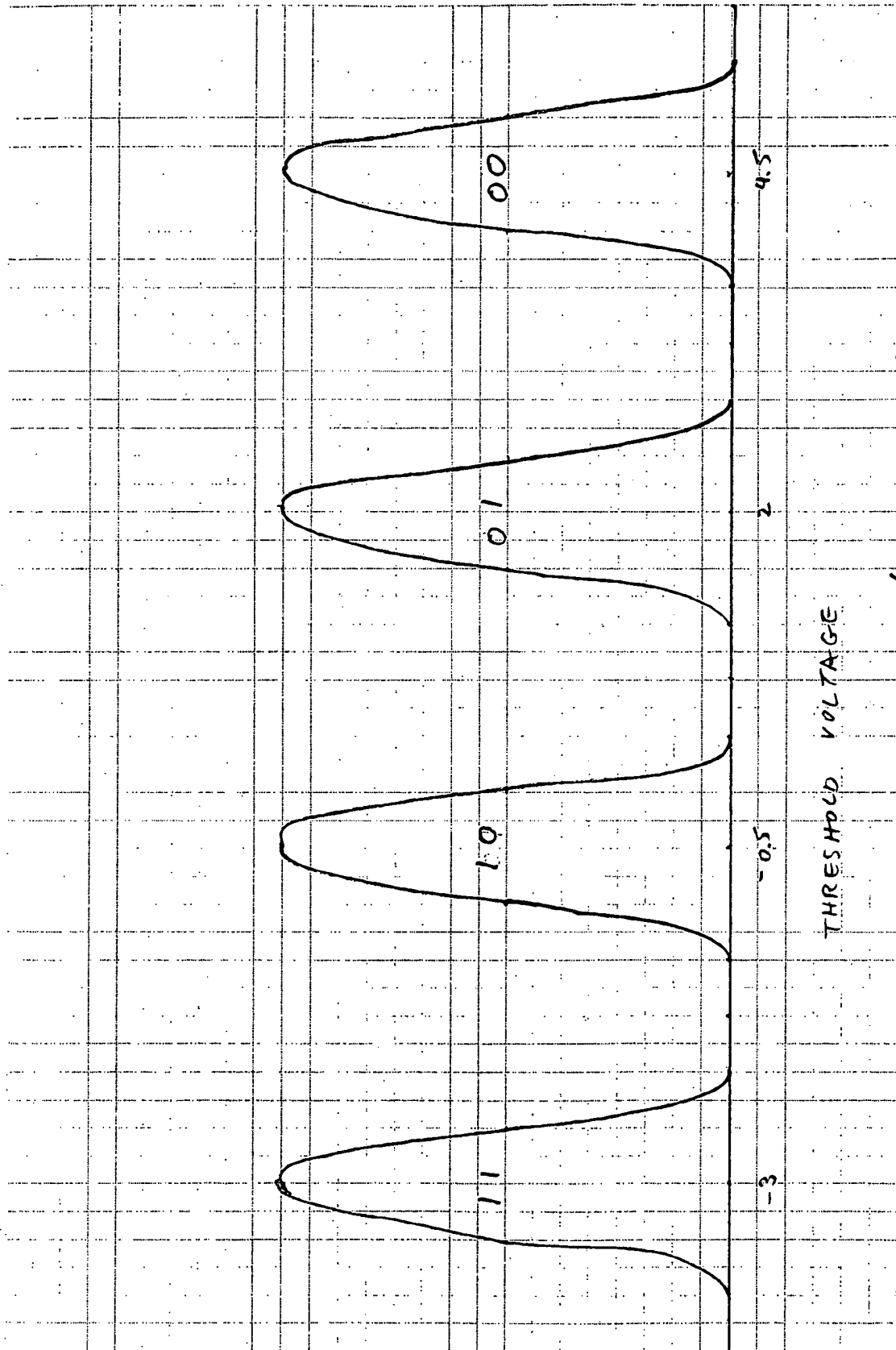


FIGURE 6 (PRIOR ART)